

## Datasheet



**Important:** For complete technical information about this product, including installation instructions, application requirements and guidelines, EU Declaration of Conformity, technical specifications, and accessories, see [www.bannerengineering.com](http://www.bannerengineering.com) and search for the Instruction Manual (p/n 208913).

- Two-dimensional laser scanner effectively protects personnel and stationary and mobile systems within a user-designated area
- Individually define up to six Safety Zones and two Warning Zones using a PC
- Safety Zone range of 5.5 meters at 70 mm resolution or 3 meters at 40 mm resolution
- Highly flexible Safety and Warning Zones can be set to match the shape of the work area
- 275° sensing angle
- Suitable for horizontal, vertical, and AGV applications

## Models

A SX5 Safety Laser Scanner System refers to the laser scanner, cordsets (ordered separately), and mounting hardware (ordered separately). Interfacing solutions include safety modules, controllers, and muting modules.

| Model | Description                           |
|-------|---------------------------------------|
| SX5-B | SX5 Safety Laser Scanner, basic model |

The following items, ordered separately from the scanner, are required to make a complete system.

| Qty | Description   |
|-----|---|
| 1   | Mounting hardware (If desired, can mount directly to a surface) |
| 1   | Machine interface cable   |
| 1   | M12 Ethernet cable  |



**Important:** Configuration software is required. The software is available at [www.bannerengineering.com/SX5](http://www.bannerengineering.com/SX5).

## Features



1. Display
2. LED indicators
3. M12 Ethernet connector cover
4. Keypad

## Specifications

### Power Consumption

No output load: 8 W at 24 V dc  
With maximum output load: 27 W at 24 V dc  
Power-up delay: 40 seconds, typical

### Current Consumption (24 V dc)

No output load: 0.3 A at 24 V dc  
With maximum output load: 1.1 A at 24 V dc

### Static Input Generic

Input voltage high: > 12 V  
Input voltage low: < 5 V  
Input current high: 2 mA at 24 V dc  
Input impedance: 12 kΩ

### Connectors

I/O and power: M12 male type A connector (8 poles)  
Ethernet to GUI or Data transmission: M12 male type D connector (4 poles)



**Power and Electrical Protection**

Protection class: III ( EN 61140 / IEC 61140 )  
 Supply voltage: Uv 24 Vdc (19.2 V ... 30 Vdc) (SELV/PELV)<sup>1</sup>  
 Residual ripple:  $\pm 5\%$ <sup>2</sup>  
 Start-up current (1):  $< 0.6\text{ A}$ <sup>3</sup>  
 The Scanner should be connected only to a SELV (Safety Extra-Low Voltage) for circuits without earth ground or a PELV (Protected Extra-Low Voltage) for circuits with earth ground power supply.

**Light Beam Diameter**

At front screen: 8 mm  
 At middle field distance: 10 mm  
 At max distance: 20 mm  
 Detectable remission: 1.8% to 1000%  
 Maximum homogeneous contamination of the optics cover without preventing the detection capability –30% of nominal optic power

**Output (warning and generic)**

Output logic and protection: PUSH-PULL, Overcurrent protection  
 Output voltage for ON status (HIGH): Uv–2 V at 250 mA  
 Output voltage for OFF status (LOW): 0 V  
 Output current for ON status (HIGH): 250 mA  
 Leakage current:  $< 700\ \mu\text{A}$ <sup>4</sup>  
 Load inductance: 2 H  
 Load capacity: 2.2  $\mu\text{F}$

**Safety Data**

Type 3 (EN 61496-1)  
 SIL 2 (IEC 61508)  
 Category 3 (EN ISO 13849-1)  
 SILCL 2 (EN 62061)  
 PL d (EN ISO 13849-1)  
 PFHd (mean probability of a dangerous failure per hour):  $6.38 \times 10^{-8}$   
 SFF: 97.58%  
 MTTFd: 61 Years  
 TM (mission time): 20 years (EN ISO 13849-1)  
 HFT (Hardware Fault Tolerance): 1  
 State of safety: OSSD in OFF State (open circuit  $\rightarrow$  I OSSD = 0)  
 Response time to malfunction:  $\leq$  Response Time

**Operating Conditions**

0 °C to +50 °C (+32 °F to +122 °F)<sup>5</sup>  
 95% maximum relative humidity (non-condensing) (According to IEC 61496-1 5.4.2; IEC 61496-3 5.4.2; 4.3.1; 5.4.4.3)

**Storage Conditions**

–20 °C to +70 °C (–4 °F to +158 °F)

**Environmental Rating**

IEC IP65

**Optical Data**

Wavelength: 905 nm  
 Pulse duration: 3 nsec  
 Average output power: 8 mW  
 Laser class: CLASS 1 (EN 60825-1)  
 Divergence of collimated beam: 0.12°

**Mechanical Data**

Dimensions (W × H × D): 112.5 × 152 × 102  
 Weight (including system plug): 1.5 kg  
 Housing material: Aluminum Alloy  
 Housing color: YellowRAL1003  
 Optics cover material: PC  
 Optics cover surface: Acrylic

**OSSD (Safety Output)**

OSSD logic and protection: PUSH-PULL, Overcurrent protection  
 Output voltage for ON status (HIGH): Uv–2V at 250 mA  
 Output voltage for OFF status (LOW): 0 V  
 Output current for ON status (HIGH): 250 mA  
 Leakage current:  $< 700\ \mu\text{A}$ <sup>5</sup>  
 Max Load inductance: 2 H  
 Max Load capacity: 2.2  $\mu\text{F}$   
 Test pulse width: 300  $\mu\text{s}$   
 Test pulse interval: 167 ms  
 OFF status duration: 900 ms  
 Latency time between output pair: 450 ms

**Features**

Safety protective field range: 3 m, 5.5 m  
 Warning field range: 40 m with remission of target = 90% (white)  
 Scanning angle: 275°  
 Detection capability: 40 mm, 70 mm  
 Scan cycle time: 30 ms  
 Response time: Programmable 62 ÷ 482 ms  
 Tolerance zone max: 150 mm  
 Angular resolution: 0.1°  
 Zones sets: 6 Max

**Vibration**

According to IEC 61496-1 4.3.3.1 ; 5.4.4.1 ; IEC 60068-2-6  
 Frequency from 10 Hz to 55 Hz ; Scan Speed 1 octave/min  
 Range: 0.35 mm  $\pm$  0.05 mm

**Shock**

According to IEC 61496-1 4.3.3.2 ; 5.4.4.2  
 IEC 60068-2-29; Acceleration: 10 g; Pulse Duration: 16 ms; Number of Shocks: 1000  $\pm$  10 (for each of the three mutually perpendicular axes)  
 IEC 61496-3 5.4.4.1-3 ; IEC 60068-2-75 ; Hammer test

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For patent information, see [www.bannerengineering.com/patents](http://www.bannerengineering.com/patents).

<sup>1</sup> To meet the requirements of the relevant product standards (e.g. EN 61496-1), the external voltage supply for the devices (SELV) must be able to bridge a brief mains failure of 20 ms. Power supplies according to EN 60204-1 satisfy this requirement.

<sup>2</sup> The absolute voltage level must not drop below the specified minimum voltage.

<sup>3</sup> The load currents for the input capacitors are not taken into account.

<sup>4</sup> In the case of a fault (0 V cable open circuit) maximally the leakage current flows in the OSSD cable. The downstream controller must detect this status as LOW. A FPLC (fail-safe programmable logic controller) must be able to identify this status.

<sup>5</sup> In the case of a fault (0 V cable open circuit) maximally the leakage current flows in the OSSD cable. The downstream controller must detect this status as LOW. A FPLC (fail-safe programmable logic controller) must be able to identify this status.

<sup>6</sup> We recommend that you allow for a 15-minute warmup from a cold start.